

CDP-CX400/CX450

SERVICE MANUAL

Ver 1.1 2001. 10

US Model
Canadian Model
CDP-CX400/CX450
AEP Model
UK Model
E Model
Australian Model
CDP-CX450



Photo; CDP-CX400

Model Name Using Similar Mechanism	NEW
CD Mechanism Type	CDM62-K1BD35A
Base Unit Type	BU-K1BD35A
Optical Pick-up Type	KSM-213BFN

SPECIFICATIONS

Compact disc player

Laser	Semiconductor laser ($\lambda = 780$ nm) Emission duration: continuous
Laser output	Max 44.6 μ W* * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up block with 7 mm aperture.
Frequency response	2 Hz to 20 kHz ± 0.5 dB
Dynamic range	More than 93 dB
Harmonic distortion	Less than 0.0045%
Output	

	Jack type	Maximum output level	Load impedance
LINE OUT	Phono jacks	2 V (at 50 k Ω)	Over 10 k Ω
DIGITAL OUT (OPTICAL)	Optical output connector	-18 dBm	Wave length: 660 nm
MONITOR OUT	Phono jacks	1 Vp-p	75 Ω , unbalanced sync negative

General

Power requirements

Where purchased	Power requirements
USA, Canadian	120 V AC, 60 Hz
Australia	240 V AC, 50/60 Hz
European	230 V AC, 50/60 Hz

Power consumption 16 W (CX400)
18 W (CX450)

Dimensions (approx.) (w/h/d) 430 \times 189 \times 537 mm
(17 \times 7 1/2 \times 21 1/4 in.) incl. projecting parts

Mass (approx.) 8.8 kg (19 lbs 7 oz.)

Supplied accessories

- Audio cord (1)
- Video cord (1) (CX450)
- Remote commander (remote) (1)
- Size AA (LR6) batteries (3)

Design and specifications are subject to change without notice.

COMPACT DISC PLAYER

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.



The following caution label is located inside of the unit.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE \triangle SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

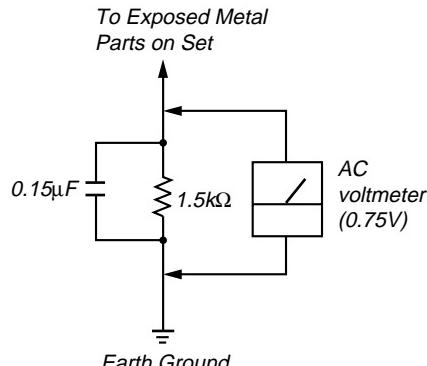
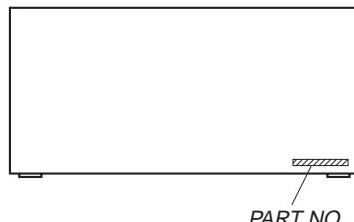


Fig. A. Using an AC voltmeter to check AC leakage.

MODEL IDENTIFICATION

— BACK PANEL —



PARTS No.	MODEL
4-226-838-0□	CX400 : US
4-226-838-1□	CX400 : CND
4-226-838-2□	CX450 : US
4-226-838-3□	CX450 : CND
4-226-838-4□	CX450 : AEP, UK
4-226-838-5□	CX450 : AUS
4-226-838-6□	CX450 : SP, MY

• Abbreviation

CND : Canadian model

AUS : Australian model

SP : Singapore model.

MY : Malaysia model.

SECTION 1

SERVICE NOTE

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NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

The emission check enables continuous checking of the S curve.

LASER DIODE AND FOCUS SEARCH OPERATION CHECK

Carry out the “S curve check” in “CD section adjustment” and check that the S curve waveform is output three times.

CD-TEXT TEST DISC

This unit is able to display the TEXT data (character information) written in the CD on its fluorescent indicator tube. The CD-TEXT TEST DISC (TGCS-313:J-2501-126-A) is used for checking the display.

To check, perform the following procedure.

Checking Method:

1. Turn ON the power, set the disc on the disc table with the side labeled as "test disc" as the right side, close the front cover, and chuck the disc.
2. The following will be displayed on the fluorescent indicator tube. (The display switches each time the [TIME/TEXT] button is pressed.)
Display : CD TEXT TEST DISC (Album Title)
3. Press the [▶] button and play back the disc.
4. The following will be displayed on the fluorescent indicator tube. (If nothing is displayed, press the [TIME/TEXT] button.)
Display : 1kHz/0 dB/ L&R
5. Rotate [◀◀] and [▶▶] knob to switch the track. The text data of each track will be displayed.
For details of the displayed contents for each track, refer to "Table 1 : CD-TEXT TEST DISC Text Data Contents" and "Table 2 : CD-TEXT TEST DISC Recorded Contents and Display".

Restrictions in CD-TEXT Display

In this unit, some special characters will not be displayed properly. These will be displayed as a space or a character resembling it. For details, refer to "Table 2 : CD-TEXT DISC Recorded Contents and Display".

Table 1 : CD-TEXT TEST DISC Text Data Contents (TRACKS No. 1 to 41:Normal Characters)

TRACK No.	Displayed Contents	TRACK No.	Displayed Contents
1	1kHz/0dB/L&R	22	1kHz/-90dB/L&R
2	20Hz/0dB/L&R	23	Infinity Zero w/o emphasis//L&R
3	40Hz/0dB/L&R	24	Infinity Zero with emphasis//L&R
4	100Hz/0dB/L&R	25	400Hz+7kHz(4:1)/0dB/L&R
5	200Hz/0dB/L&R	26	400Hz+7kHz(4:1)/-10dB/L&R
6	500Hz/0dB/L&R	27	19kHz+20kHz(1:1)/0dB/L&R
7	1kHz/0dB/L&R	28	19kHz+20kHz(1:1)/-10dB/L&R
8	5kHz/0dB/L&R	29	100Hz/0dB/L*
9	7kHz/0dB/L&R	30	1kHz/0dB/L*
10	10kHz/0dB/L&R	31	10kHz/0dB/L*
11	16kHz/0dB/L&R	32	20kHz/0dB/L*
12	18kHz/0dB/L&R	33	100Hz/0dB/R*
13	20kHz/0dB/L&R	34	1kHz/0dB/R*
14	1kHz/0dB/L&R	35	10kHz/0dB/R*
15	1kHz/-1dB/L&R	36	20kHz/0dB/R*
16	1kHz/-3dB/L&R	37	100Hz Squer Wave//L&R
17	1kHz/-6dB/L&R	38	1kHz Squer Wave//L&R
18	1kHz/-10dB/L&R	39	1kHz w/emphasis/-0.37dB/L&R
19	1kHz/-20dB/L&R	40	5kHz w/emphasis/-4.53dB/L&R
20	1kHz/-60dB/L&R	41	16kHz w/emphasis/-9.04dB/L&R
21	1kHz/-80dB/L&R		

NOTE : The contents of Track No. 1 to 41 are the same as those of the current TEST DISC-their titles are displayed.

Table 2: CD-TEXT TEST DISC Recorded Contents and Display
 (In this unit, some special characters cannot be displayed. This is no a fault.)

TRACK No.	Recorded contents	Display
42	! " # \$ % & ' (21h to 27h) 1kHz 0dB L&R	← All the same
43	() * + , - . / (28h to 2Fh)	← All the same
44	0 1 2 3 4 5 6 7 (30h to 37h)	← All the same
45	8 9 : ; < = > ? (38h to 3Fh)	← All the same
46	@ A B C D E F G (40h to 47h)	← All the same
47	H I J K L M N O (48h to 4Fh)	← All the same
48	P Q R S T U V W (50h to 57h)	← All the same
49	X Y Z [¥] ^ _ (58h to 5Fh)	X Y Z [\] ^ _ (58....)
50	` a b c d e f g (60h to 57h)	← All the same
51	h i j k l m n o (68h to 6Fh)	← All the same
52	p q r s t u v w (70h to 77h)	← All the same
53	x y z { } ~ (78h to 7Fh)	x y z { } ~ (78....)
54	¤ i ¢ £ ¤ ¥ ¤ § (A0h to A7h) 8859-1	i ¢ £ ¤ ¥ ¤ § (A0.... ¤ is not displayed)
55	♪ © ª « ¬ ® ® ¬ (A8h to AFh)	♪ (A8.... © ª « ¬ ® ® ¬ are not displayed)
56	• ± ² ³ ' μ ¶ • (B0h to B7h)	' μ • (B0.... • ± ² ³ ¶ are not displayed)
57	† ¹ ⁰ » ¼ ½ ¾ ˙ (B8h to BFh)	† ˙ (B8.... ¹ ⁰ » ¼ ½ ¾ are not displayed)
58	À Á Â Ã Ä Å Æ Ç (C0h to C7h)	← All the same
59	È É Ê Ë Ì Í Î Ï (C8h to CFh)	← All the same
60	Ð Ñ Ò Ó Ô Ö Ö × (D0h to D7h)	← All the same
61	Ø Ù Ú Û Ü Ý Þ ß (D8h to DFh)	Φ Ù Ú Û Ü Ý Þ ß (D8....)
62	à á â ã ä å æ ç (E0h to E7h)	← All the same
63	è é ê ë ì í î ï (E8h to FFh)	← All the same
64	ð ñ ò ó ô ö õ ÷ (F0h to F7h)	ð ñ ò ó ô ö õ ÷ (F0....)
65	ø ù ú û ü ý þ ÿ (F8h to FFh)	← All the same
66	No.66	← All the same
67	No.67	← All the same
to	to	to
99	No.99	← All the same

SECTION 2 GENERAL

Front Panel

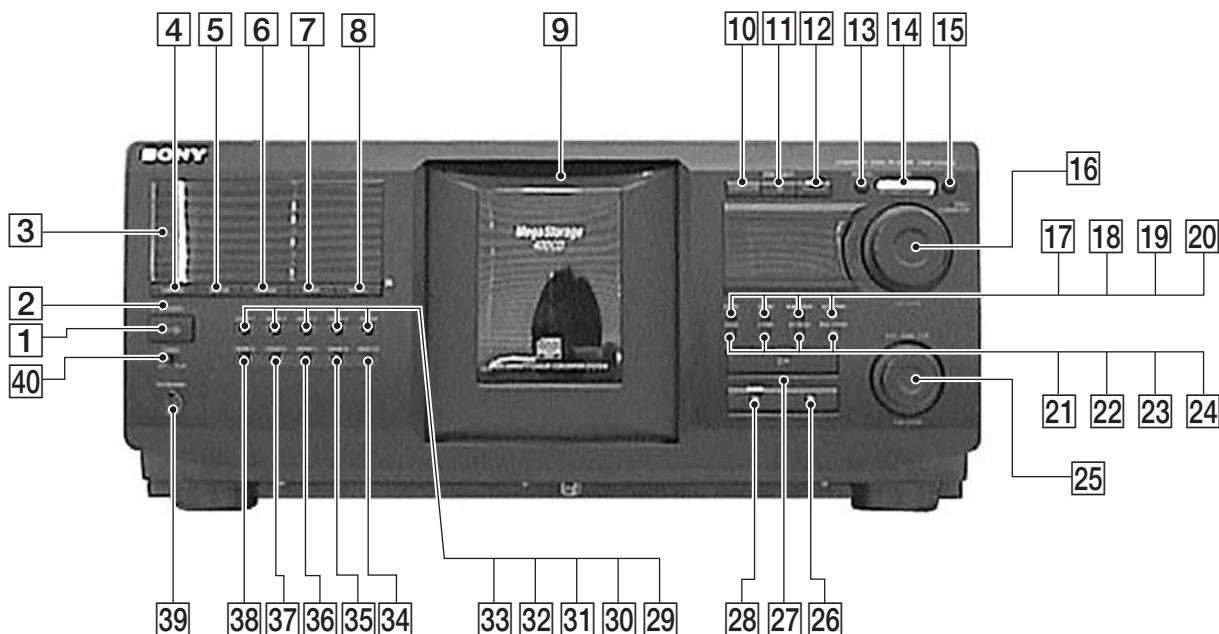


Photo: CDP-CX400

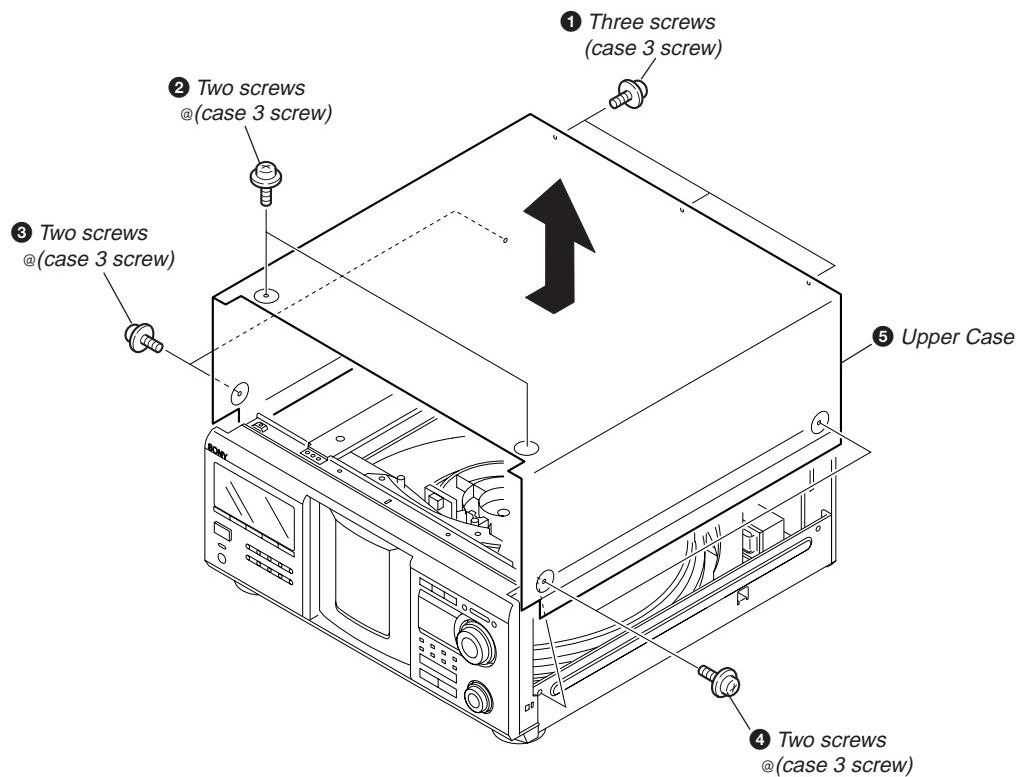
LOCATION OF PARTS AND CONTROLS

- | | |
|--|--|
| [1] I/Ø (power) button | [21] FADER button |
| [2] STANDBY indicator | [22] X-FADE button |
| [3] Display window | [23] NO DELAY button |
| [4] CONTINUE button | [24] MEGA CONTROL button and indicator |
| [5] SHUFFLE button | [25] AMS/PUSH ENTER knob and button |
| [6] PROGRAM button | [26] ■ (stop) button |
| [7] REPEAT button | [27] ▷ (play) button and indicator |
| [8] SCROLL button | [28] ■ (pause) button and indicator |
| [9] Front cover | [29] HIT LIST button and indicator |
| [10] OPEN/CLOSE button | [30] GROUP 4 button and indicator |
| [11] DISC EJECT button | [31] GROUP 3 button and indicator |
| [12] EASY PLAY button and indicator | [32] GROUP 2 button and indicator |
| [13] MENU/NO button | [33] GROUP 1 button and indicator |
| [14] +100 button | [34] GROUP FILE button |
| [15] YES button | [35] GROUP 8 button and indicator |
| [16] DISC/CHARACTER/PUSH ENTER knob and button | [36] GROUP 7 button and indicator |
| [17] CHECK button | [37] GROUP 6 button and indicator |
| [18] CLEAR button | [38] GROUP 5 button and indicator |
| [19] NAME SEARCH button | [39] KEYBOARD jack |
| [20] ARTIST MODE button and indicator | [40] TIMER OFF/PLAY switch |

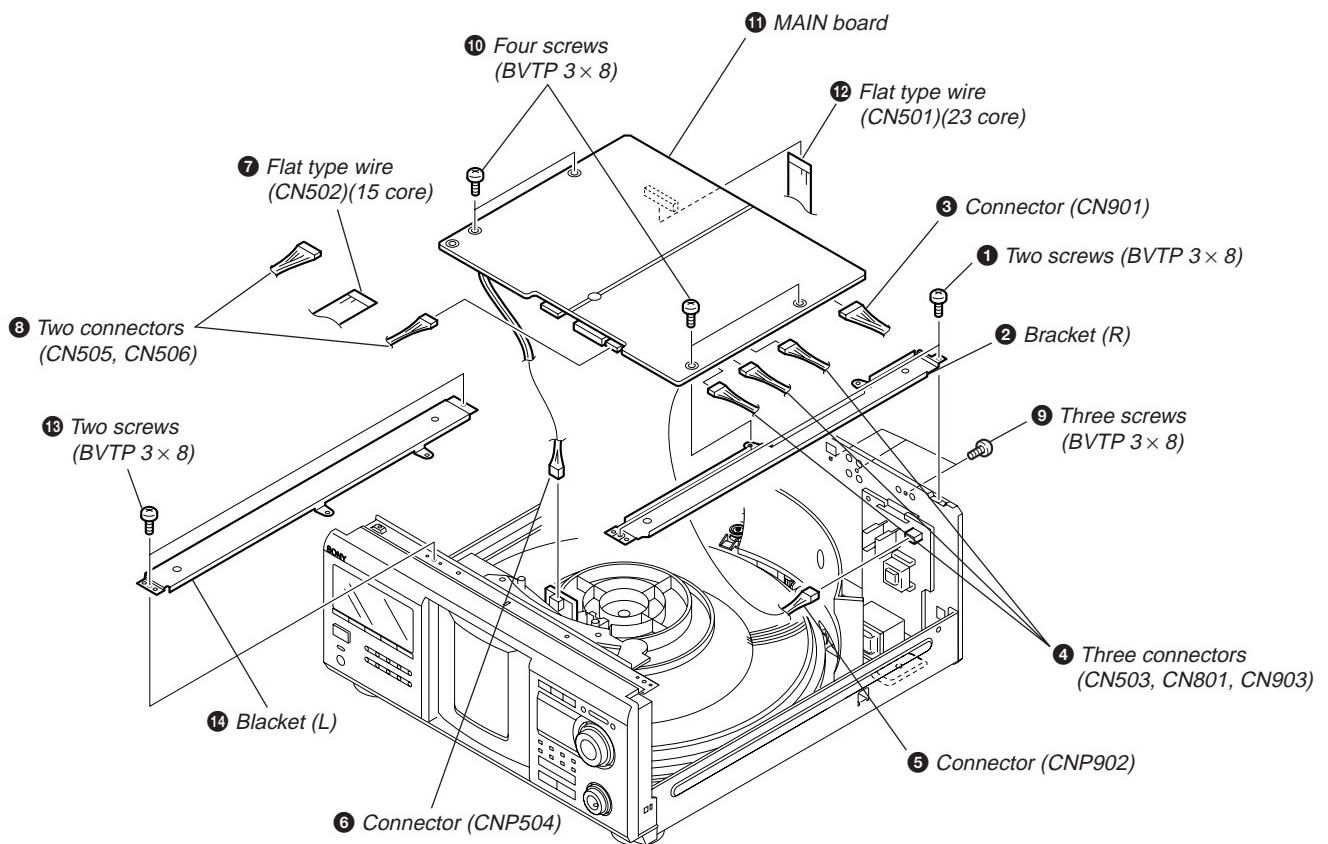
SECTION 3 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

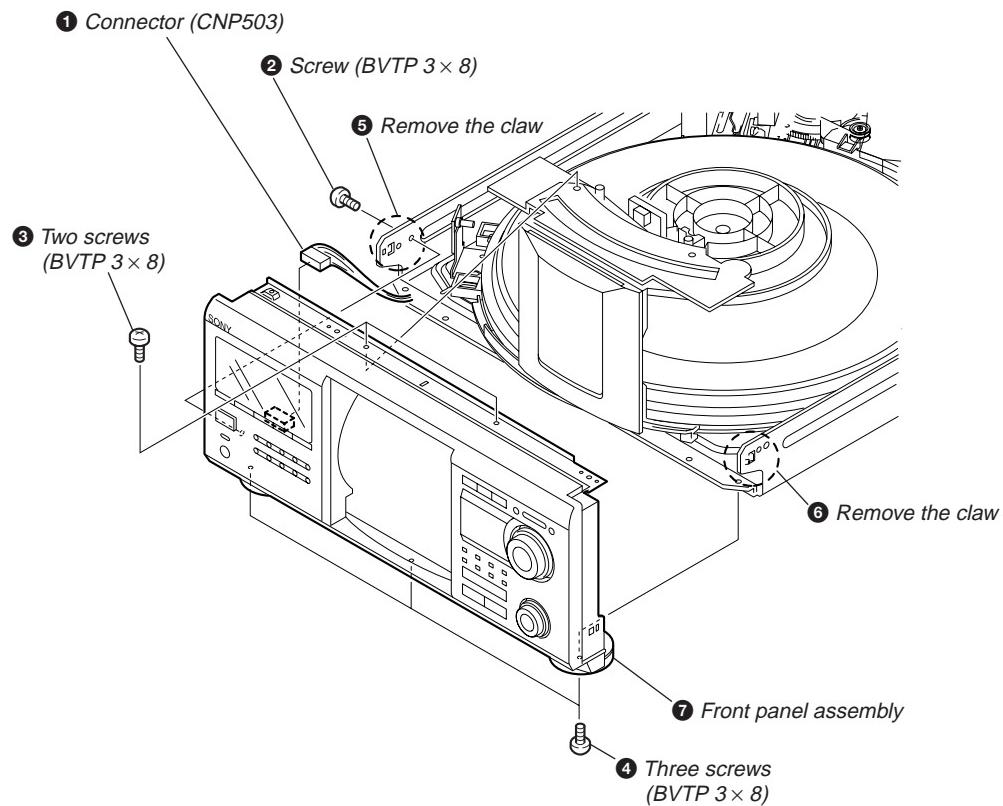
3-1. UPPER CASE



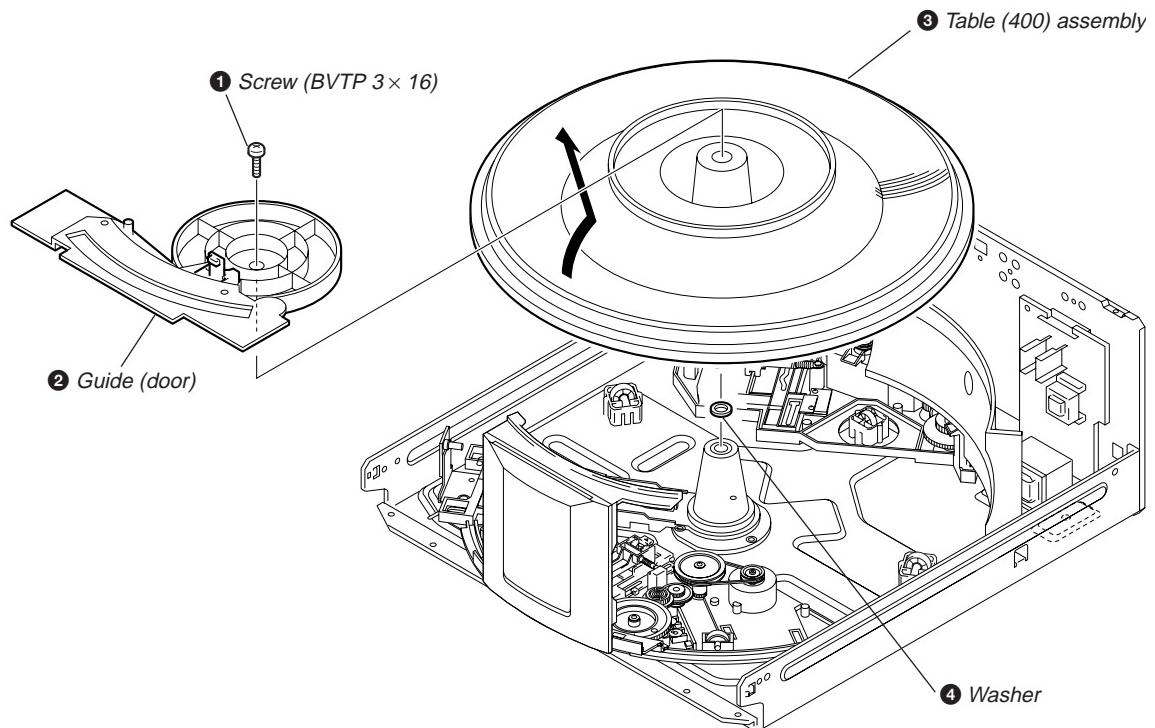
3-2. MAIN BOARD



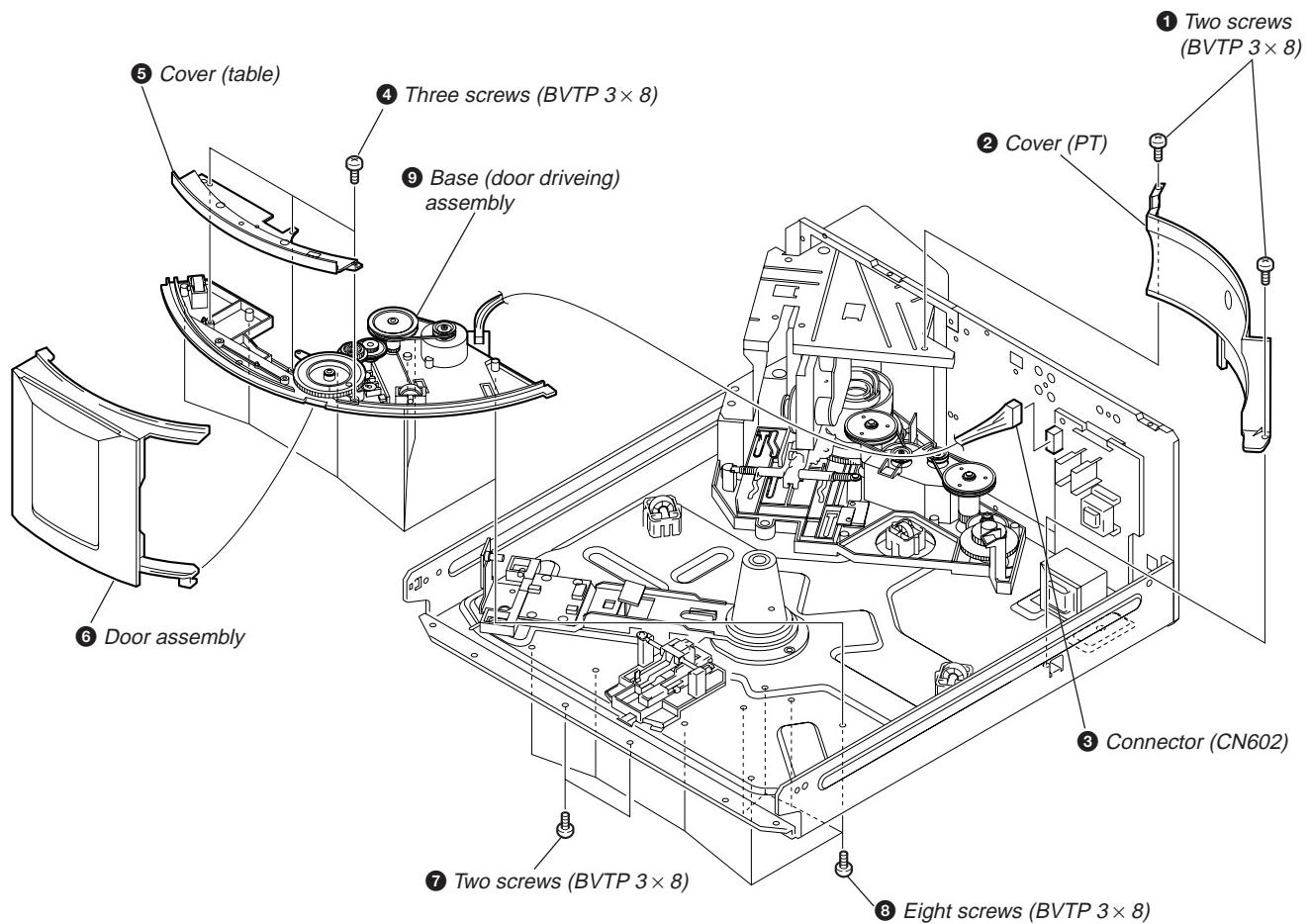
3-3. FRONT PANEL ASSEMBLY



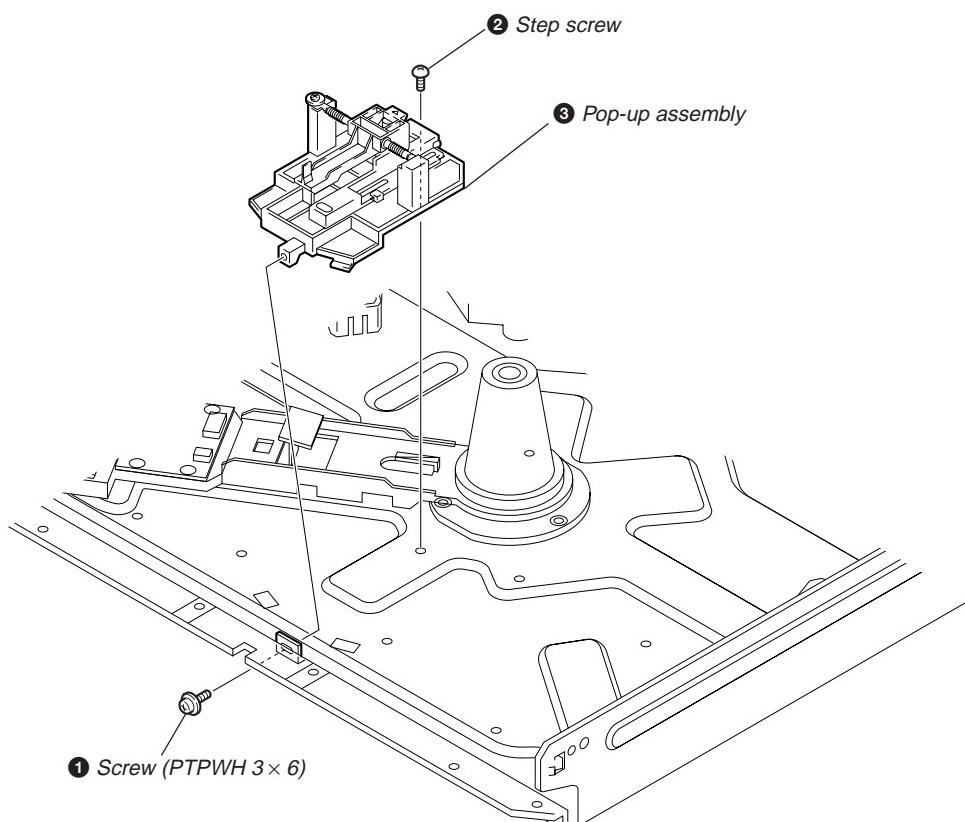
3-4. TABLE (400) ASSEMBLY



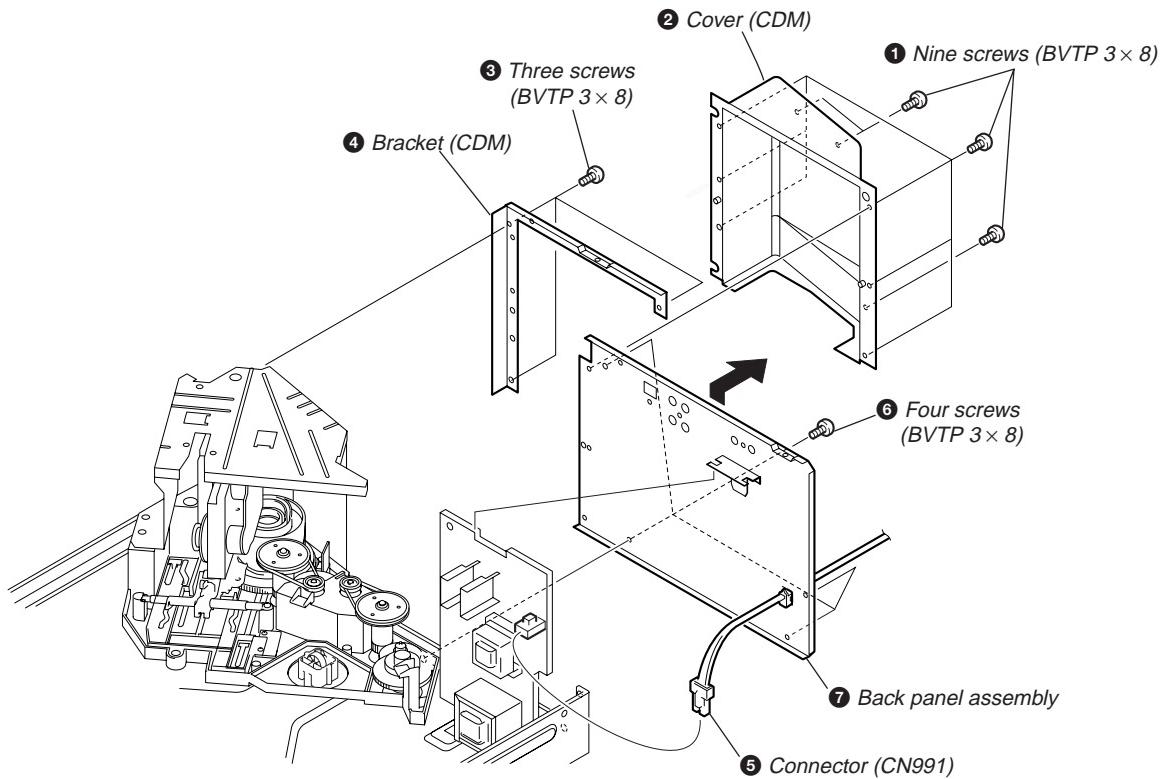
3-5. BASE (DOOR DRIVING) ASSEMBLY



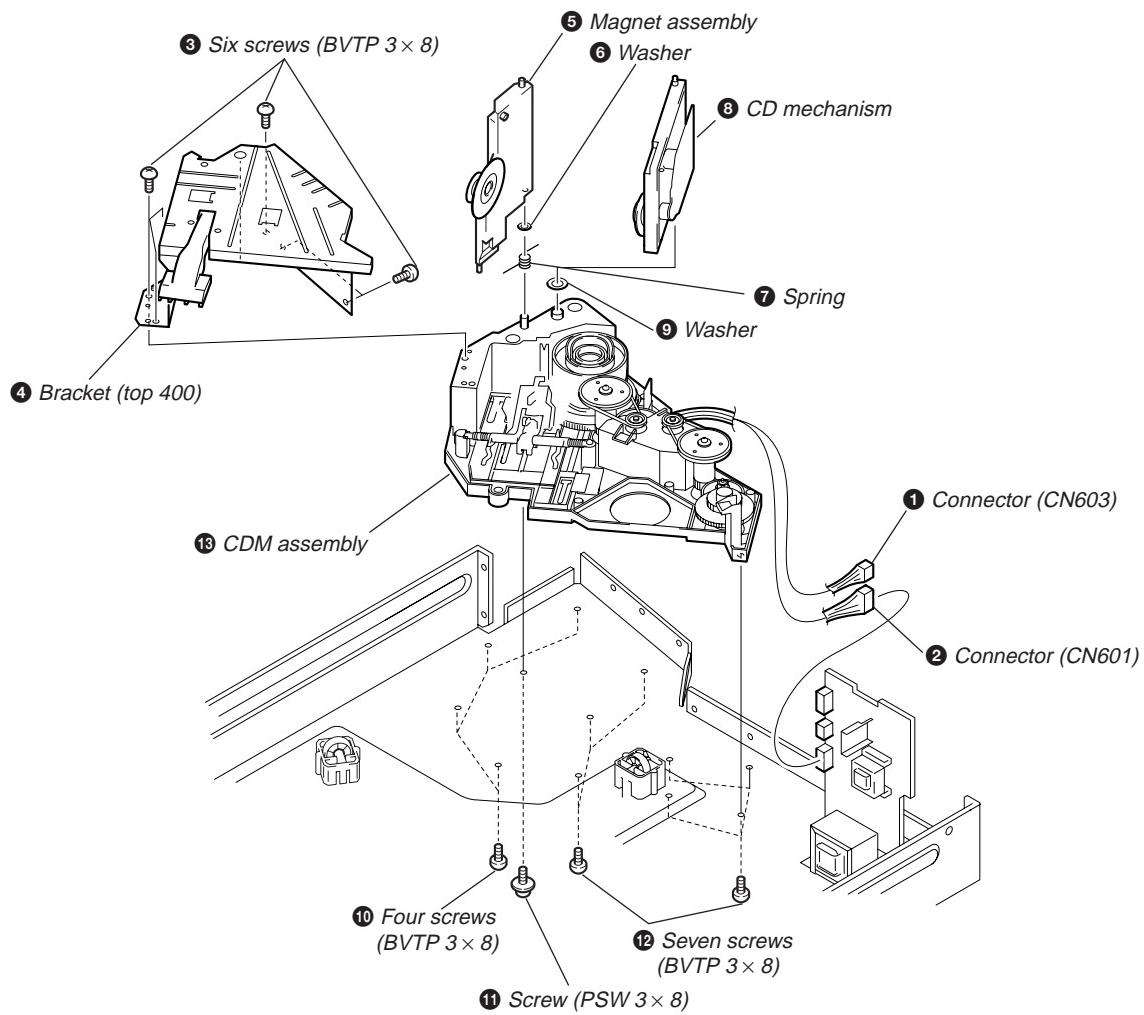
3-6. POP-UP ASSEMBLY



3-7. BACK PANEL ASSEMBLY



3-8. CDM ASSEMBLY



SECTION 4 SERVICE MODE

SPECIAL FUNCTION

This unit is provided with several service modes.

Details are shown in the following table.

Turn on the power and press [GROUP FILE], [MEGA CONTROL] and [I/O] buttons.

Rotate the [DISC/CHARACTER] dial to enter any of the following modes.

Display	
Mech Adjust	Mechanism adjustment mode
Table Roatation	Mode in which table keeps rotating
All Lit Mode	All lights ON mode
Ship Mode	Default mode
Normal Aging	Normal aging mode
Table Aging	Table aging mode
Door Popup Aging	Door/popup aging mode
Color Bar (OSD)	Color bar on OSD
Test Disp (OSD)	TEST DISPLAY for OSD
Memo Copy Mode	Memo copy mode
Model Name	Model name display
Show Mcom Ver.	Software version display
Demo	400-memo writing mode
BUS Check	Bus check
M kentou	Loading aging

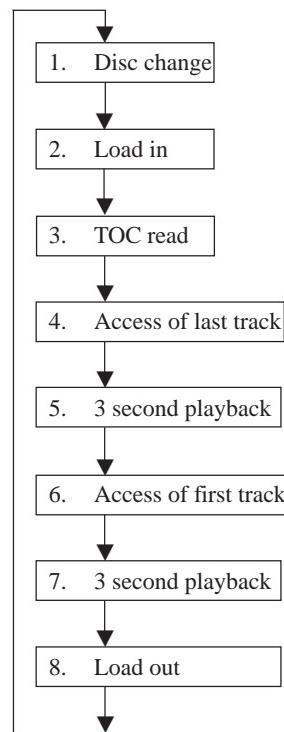
To exit the mode, press [I/O] button to enter the standby state.

(When selecting the Ship mode, the standby mode is automatically entered.)

AGING MODE

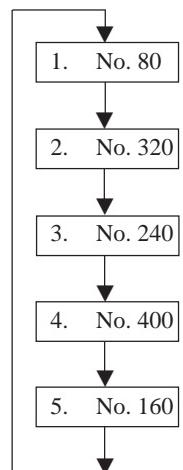
- Mode which repeatedly changes and plays back discs automatically in the unit.
 - It will repeat aging as long as no errors occur.
 - If an error occurs during aging, it will stop all servos, motors, etc. instantaneously, display the error number, and stop operations. However, the stopping conditions differ according to whether the unit is equipped with the “self-protection function during errors” described later.
- The function serves to maintain the state of the unit when errors occur.

Sequence of Aging Mode



Order of Disc Change

(1 cycle takes 3 minutes)



Special Aging Mode Functions

The aging mode is provided with the following convenient functions

- Disc setting mode (*1)
- Selection of presence of protection function during error (*2)
- Count function of aging cycle (*3)

*1 Disc setting mode:

5 discs are set before setting the aging mode. This mode makes the setting of these discs more easy.

*2 Self protection function during errors:

Function which voluntarily corrects errors which occur during normal operations by retries.

If this function is not provided, all operations will be stopped without retiring. It is suitable for checking errors with low reproducibility.

If this function is provided, and errors can be corrected by retries, aging will be continued without stopping.

*3 Aging cycle count function:

Functions which displays the number of agings carried out on the Fluorescent indicator tube in numbers. One aging cycle consists of five discs.

Aging Procedure

1. Turn on the power and press the [GROUP FILE], [MEGA CONTROL] and [] buttons.
2. Rotate [DISC/CHARACTER] dial, select “Normal Aging” and press the dial to start the aging mode.
3. When the disc set mode is set, the [] and [] LEDs blink.
4. Rotate the [DISC/CHARACTER] dial. The slits (No. 80, 160, 400, 240, 320) for setting the discs will come forward. Insert the discs into these slits. Do not set the discs in other slits.
5. Set whether the self-protection function during errors is equipped with the unit. Press the [REPEAT] button. If “REPEAT” is displayed on the Fluorescent indicator tube, it means the function is provided. If “REPEAT” is not displayed, it means the function is not provided.
6. Press the [] button.
7. The [] LED blinks, the aging mode is set, and aging is started.
8. The aging cycle lasts 3 minutes. If errors occur during aging, the error number will be displayed on the Fluorescent indicator tube. (Refer to the following table for the details of the errors.)
9. Aging will be repeated as long as no errors occur.
10. After each aging cycle, the number displayed on the Fluorescent indicator tube will increase.
11. To end aging, to end aging, press the [] button to enter the standby mode.

Error code

Code number	Name	Contents
#Err 01	DISC sensor check 1	No disc in the specified slit
#Err 02	DISC sensor check 2	Disc in other slits
#Err 03	Table operation check 1	Table motor current over
#Err 04	Table operation check 2	No table sensor input
#Err 05	Loading operation check 1	Load in timeover
#Err 06	Loading operation check 2	Load out timeover
#Err 08		Table is not stopped within the specified time.
#Err 09		Stopped while both T.SENS 1 and 2 are “LOW”.
#Err *1	BU related check 1	Access timeover
#Err *2	BU related check 2	During high speed playback, COUNT timeout
#Err *3	BU related check 3	Q data read error
#Err *4	BU related check 4	JBU operation (from focus search to until signal can be read) timeover
#Err *5	BU related check 5	GFS monitor error
#Err *6	BU related check 6	Focus cannot be imposed by focus search

The * numbers mean the following according to the state of the unit during aging

2 : From chucking to end of TOC read

3 : From end of TOC read to end of last track playback

4 : From end of last track playback to end of first track playback

: DISC No.

LOADING AGING MODE

- This mode is used for repeating loading operations continuously.
- Aging will be performed continuously unless an error occurs.
- When an error occurs, the error code will be displayed on the fluorescent indicator tube.

Procedure:

1. Set a disc in the DISC 1 slit.
2. Turn on the power and press the [GROUP FILE], [MEGA CONTROL] and [I/O] buttons.
Rotate the [DISC/CHARACTER] dial, select “Table Roatation” and press the dial.
3. When the mode is set, both the [\triangleright] and [\parallel] indicators will start to blink.
4. When the [\triangleright] button is pressed, only the [\triangleright] indicator will blink and aging starts.
5. To end the mode, press the [I/O] button or disconnect the power cord from the outlet.

The error codes displayed during operations and when errors occur are the same as the “**AGING MODE**” described earlier.

TABLE AGING MODE

- This mode is used for rotating the table randomly.
- Aging will be performed continuously unless an error occurs.
- When an error occurs, the error code will be displayed on the fluorescent indicator tube.

Procedure:

1. Turn on the power and press the [GROUP FILE], [MEGA CONTROL] and [I/O] buttons.
Rotate the [DISC/CHARACTER] dial, select “Table Aging” and press the dial.
Rotate the [DISC/CHARACTER] dial and set the disk in the slit whose number is being displayed (150, 149, 300, 1, 2)
2. When the mode is set, both the [\triangleright] and [\parallel] indicators will start to blink.
3. When the [\triangleright] button is pressed, only the [\triangleright] indicator will blink and aging starts.
4. To end the mode, press the [I/O] button or disconnect the power cord from the outlet.

During aging, operations will be carried out sequentially in the order of No. 1, No. 2, No. 150, No. 149, and No. 300 slits.

The error codes displayed during operations and when errors occur are the same as the “**AGING MODE**” described earlier.

DOOR POP UP AGING MODE

- This mode is used for performing aging of the CD pop up part and door open/close.
- It is used for checking if operations are performed normally.

Method:

1. Turn on the power and press the [GROUP FILE], [MEGA CONTROL] and [I/O] buttons.
Rotate the [DISC/CHARACTER] dial, select “Door Popup Aging” and press the dial.
2. Aging starts, and door open/close and up/down operations of the pop up part are performed continuously.
3. To end the mode, press the [I/O] button.

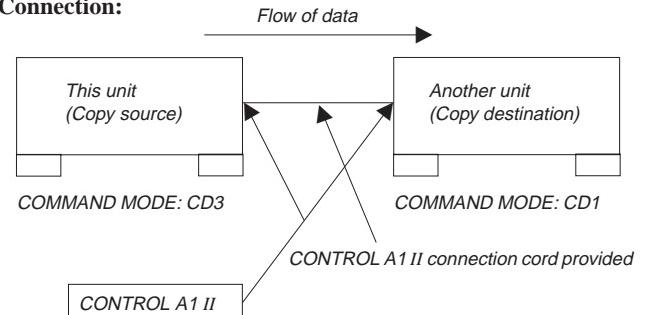
TABLE ROTATION MODE

- This mode is used for electrical adjustments. Refer to the section on Electrical Adjustments.

TITLE MEMO SHIFT MODE

- This mode is used for writing title memo information recorded in this unit in a different unit.
- Use it for transferring disc memo contents written by the customer to the new units when replacing the unit, etc.

Connection:



Procedure:

1. Connect two units using the [CONTROL A1 II] connection cord shown in the figure.
2. Set the [COMMAND MODE] switch of the copy source unit to [CD3] and the [COMMAND MODE] switch of the copy destination unit to [CD1].
3. With the power on, while pressing the [GROUP 7] button and [\triangle OPEN/CLOSE] button of the copy destination unit, press the [+100] button.
4. When the data has been transferred, the fluorescent indicator tube displays “complete” for about 1 second.

MODEL NAME DISPLAY

- Model names can be displayed on the fluorescent indicator tube for checking the microprocessor model setting, etc.

Procedure:

With the power ON, while pressing the [GROUP FILE] and [MEGA CONTROL] buttons, press the [I/O] button.
Rotate the [DISC/CHARACTER] dial, select “Model Name” and press the dial.

The model name is displayed on the fluorescent indicator tube.
Let the model name be displayed for three seconds and exit the mode.

MICROPROCESSOR VERSION DISPLAY

- The microprocessor version can be displayed on the fluorescent indicator tube.

Procedure:

With the power ON, while pressing the [GROUP FILE] and [MEGA CONTROL] buttons, press the [I/O] button.
Rotate the [DISC/CHARACTER] dial, select “Show Mcom Ver.” and press the dial.

The microprocessor version is displayed on the fluorescent indicator tube.

Let the model name be displayed for three seconds and exit the mode.

ALL LIT MODE

- This mode is used for lighting the whole fluorescent indicator tubes and LEDs.

Procedure:

With the power ON, while pressing the [GROUP FILE] and [MEGA CONTROL] buttons, press the [I/O] button.
Rotate the [DISC/CHARACTER] dial, select “All Lit Mode” and press the dial.

Both the fluorescent indicator tubes and LEDs will light up completely.

To end this mode, press the [I/O] mode.

MECHANISM ADJUSTMENT MODE

- This mode is used for mechanism adjustments. Refer to the section on Mechanism Adjustments.

SHIPMENT MODE

- This mode is used for setting the unit to the shipment state. Do not execute it without a proper reason as it erases the memory of the title memo recorded by the customer.

Procedure:

Set the **TIMER** switch to **OFF**. Next, with the power ON, while pressing the **GROUP FILE** button and **MEGA CONTROL** button, press the **I/O** button. If the switch state is normal, the model name will be displayed on the fluorescent indicator tube and the unit will set into the shipment mode.

If the various switches are not set to their designated positions, error will be displayed on the fluorescent indicator tube.

TITLE MEMO RECORDING CHECK MODE

This mode is not required for servicing. Do not execute without a proper reason.

If executed, the memory of the title memo recorded by the customer will be erased.

SECTION 5 TEST MODE

5-1. ADJ Mode

1. Turn ON the power of the unit, set disc to disc table, and perform chucking.
2. Disconnect the power supply plug from the outlet.
3. To set ADJ mode, connect the test point (ADJ) of the MAIN board to Ground, and connect the power supply plug to the outlet.

In this mode, table rotation and loading operations are not performed because it is taken that the disc has already been chucked.

Note: The same operations are also performed in the following when the test point (ADJ) is connected to Ground after turning on the power.

- Direct search (movement of sledding motor) is not performed during accessing
- Ignored even when GFS becomes L
- Ignored even when the Q data cannot be read
- Focus gain does not decrease

ADJ Mode Special Functions Table

(The buttons shown with () function by using the supplied remote commander only)

Button	Function
CONTINUE	Servo average display Displays VC, FE, RF, TE and traverse in hexadecimal numbers
SHUFFLE	Focus bias display Each time this is pressed, the focus bias is switched between 1 and 2 (1) Bias actually set Optimum bias Minimum jitter (2) +:Upper aliasing bias -:Lower aliasing bias
PROGRAM	Auto gain display Displays focus, tracking, sledding in hexadecimal numbers
GROUP 3 (3)	Turns off the tracking and sledding servo
GROUP 8 (8)	Turns on the tracking and sledding servo
CHECK	S-JI mode. (Exits this mode when the [V/U] button is pressed.)

To end the ADJ mode

1. Press the **[V/U]** button and disconnect the plug.
2. Remove the wire between ADJ and GND.

5-2. Key and Display Check Mode

To set this mode, connect the test point (AFADJ) on the MAIN board to Ground, and connect the power supply plug to the outlet.

Note: When this mode is executed, all title memos recorded will be erased.

- When this button is pressed, “line # No. #” will be displayed. However, these will not be displayed for the following special buttons. However, these will not be displayed for the following special buttons.

[■] (stop) button: FL segment check
(Refer to FL Tube Check Patterns)

[■] (pause) button: FL grid check
(Refer to FL Tube Check Patterns)
The **[■]** LED also lights up simultaneously.

[▷] (play) button: All FL segment and grid will light up.
[▷] LED also lights up simultaneously.

TIMER switch: When the switch position is **[PLAY]**, the **[STANDBY]** LED lights up. It goes OFF when set to **[OFF]**.

Each time this button is pressed, the value of the “Got ## keys” increases. Buttons pressed once will not be counted when pressed again.

FL Tube Check Patterns

Segment check



Grid check



• When the jog dial and AMS is rotated to the right, the GROUP LEDs light up in the order of 1→2..8→HIT LIST→EASY PLAY ARTIST MODE →MEGA CONTROL→1.

• When the jog dial and AMS is rotated to the left, the GROUP LEDs light up in the order of 8→7..1 →MEGA CONTROL ARTIST MODE →EASY PLAY→HIT LIST→8.

- Abbreviation

FL: Fluorescent Indicator Tube

To end the ADJ mode

1. Disconnect the plug.
2. Remove the wire between AFADJ and GND.

Adjustment Location: MIAN board (See page 26)

SECTION 6 ADJUSTMENTS

6-1. MechanICAL Adjustments

Pop Up Mechanism Adjustment

1. Turn on the power and set the dick to number 24.
2. With the power ON, while pressing the [GROUP FILE] and [MEGA CONTROL] buttons, press the [] button to enter the Adjustment mode.
3. Rotate the JOG dial and select the mechanism adjustment mode. ("Mech Adjust" is displayed.)
4. Press the JOG dial.
5. Keep pressing the [GROUP 1] button to operate the loading mechanism, and continue pressing until the disc table locks. (Fig-1)
6. Loosen the adjusting screw, move the screwdriver left and right until the lever (POP UP) does not touch the slit wall, and secure the screw. (Fig-2)

The following buttons have special functions in this mode.

[GROUP 1]	button: Loading mechanism IN operation
[GROUP 5]	button: Loading mechanism OUT operation
[GROUP 2]	button: Pop up part UP operation
[GROUP 6]	button: Pop up part DOWN operation

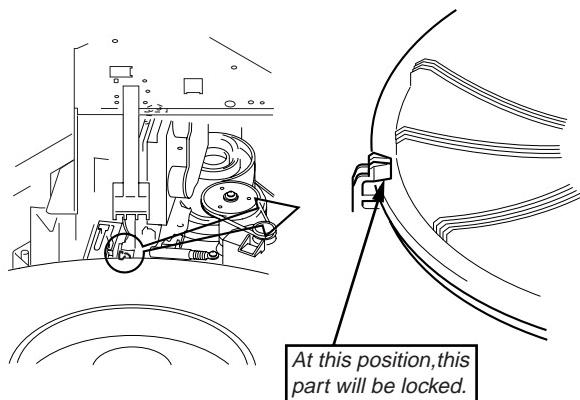


Fig-1

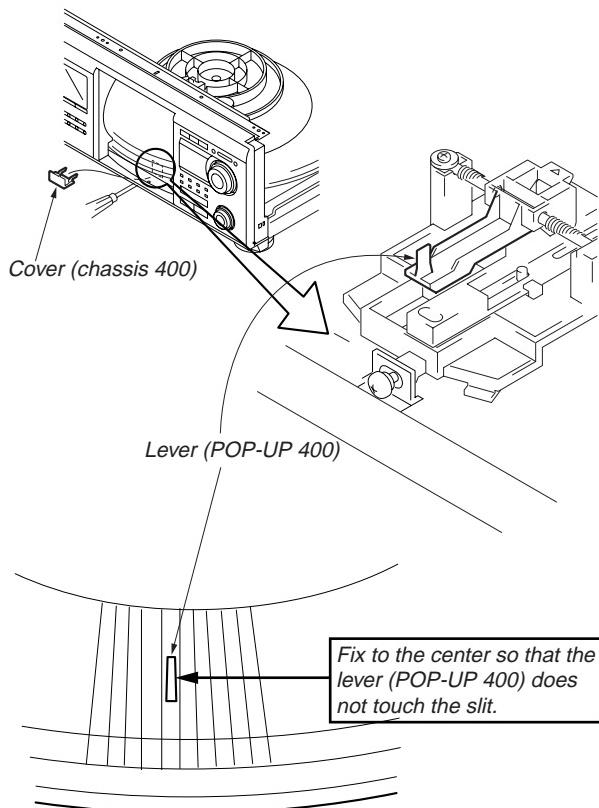


Fig-2

Sensor Adjustment

1. Enter the adjustment mode and select “Mech Adjust” with the JOG dial, and press the dial.
2. Press the [GROUP 1] button to operate the loading mechanism, and continue pressing until the disc table locks. (Fig-3)
3. Loosen the fixing screw and move the holder so that both PLAY button LED (green) and the ARTIST MODE button LED (green) light. If the holder is not in the correct position, the MEGA CONTROL button LED (orange) or the PAUSE button LED (orange) lights.
4. Moving the disc table right and left with a hand after the screw is fixed, the table will move by the play of a disc table. If the LEDs light up alternately, the adjustment will be performed correctly. (Fig-4)

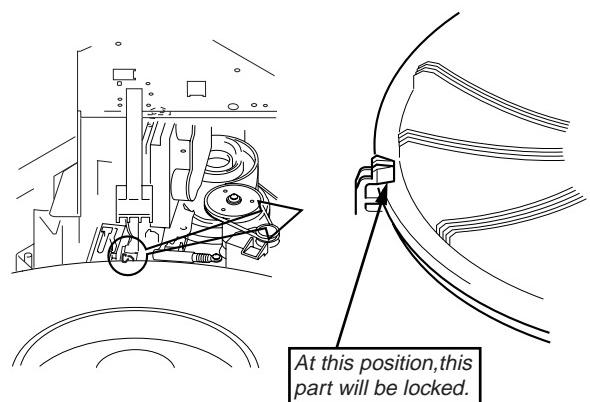


Fig-3

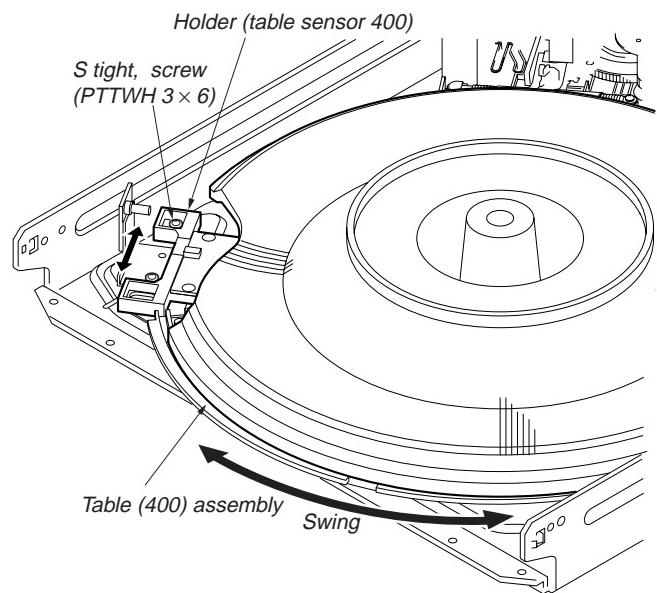
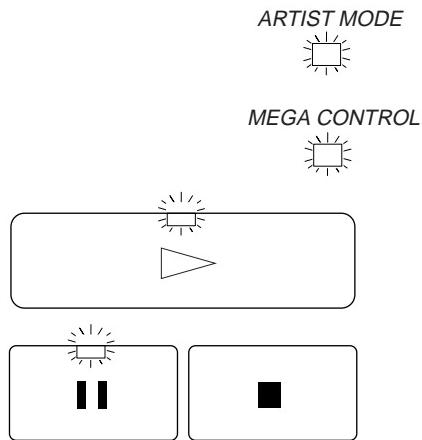


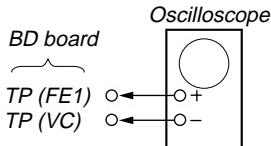
Fig-4

6-2. ELECTRICAL ADJUSTMENT

Note:

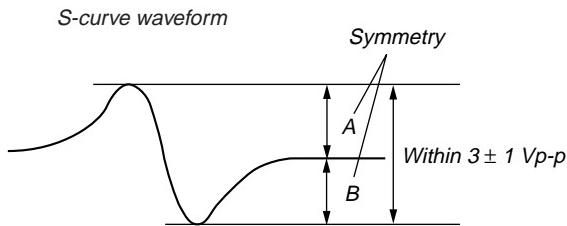
- CD Block is basically designed to operate without adjustment. Therefore, check each item in order given.
- Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
- Use an oscilloscope with more than $10M\Omega$ impedance.
- Clean the object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

S-Curve Check



Procedure :

- Chuck the disc (YEDS-18) beforehand, and disconnect the power cord from the outlet.
- Connect oscilloscope to test point TP (FE1) on BD board.
- Connect test point (ADJ) on MAIN board to ground with lead wire.
- The ADJ mode is set when the power cord is inserted into the outlet and power is supplied.
- The fifth track is played automatically.
- Press the **CHECK** button.
- Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 3 ± 1 Vp-p.



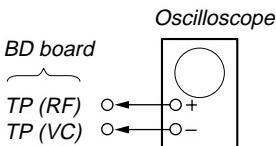
- Pressing the **I/O** button stops the output of the waveform (s-curve).
- After check, remove the lead wire connected in step 3.

Note :

- Try to measure several times to make sure than the ratio of A : B or B : A is more than 10 : 7.
- Take sweep time as long as possible and light up the brightness to obtain best waveform.

Adjustment Location: BD board (See page 19)

RF Level Check

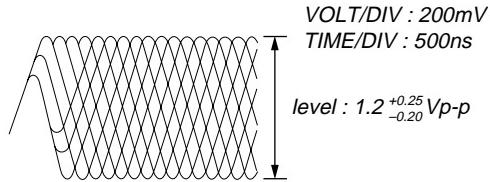


Procedure :

- Connect oscilloscope to test point TP (RF) on BD board.
- Turn Power switch on.
- Put disc (YEDS-18) in to play the number five track.
- Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

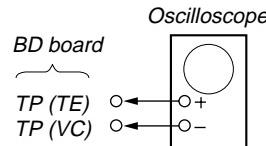
Note: A clear RF signal waveform means that the shape “◊” can be clearly distinguished at the center of the waveform.

RF signal waveform



Adjustment Location: BD board (See page 19)

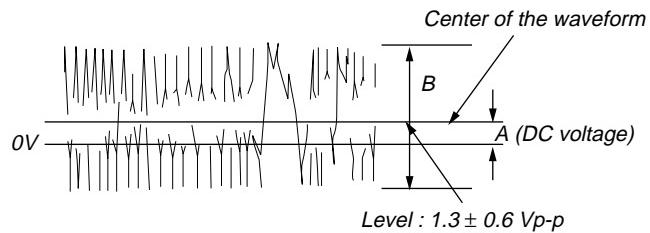
E-F Balance Check



Procedure :

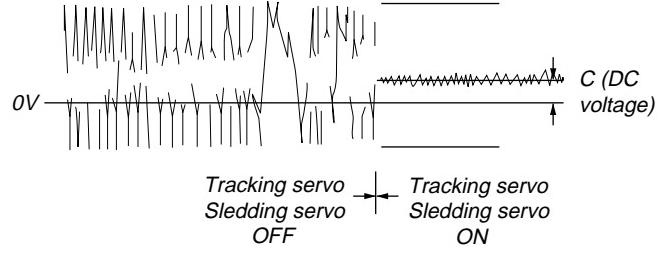
- Chuck the disc (YEDS-18) beforehand, and disconnect the power cord from the outlet.
- Connect oscilloscope to test point TP (TE) on BD board.
- Connect test point (ADJ) on MAIN board to ground with lead wire.
- The ADJ mode is set when the power cord is inserted into the outlet and power is supplied.
- The fifth track is played automatically.
- Press the **GROUP 3** button. (The tracking servo and the sledding servo are turned OFF.)
- Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform. Confirm the following : $A/B \times 100 = \text{less than } \pm 22\%$

Traverse waveform



- Press the **GROUP 8** button. (The tracking servo and sledding servo are turned ON.) Confirm the C (DC voltage) is almost equal to the A (DC voltage) is step 7.

Traverse waveform



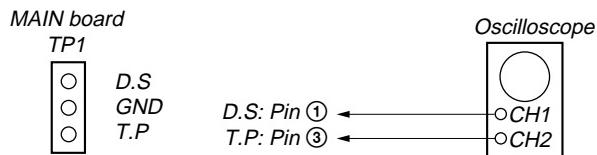
- Disconnect the lead wire of TP1 (ADJ) connected in step 2.

Adjustment Location: BD board (See page 19)

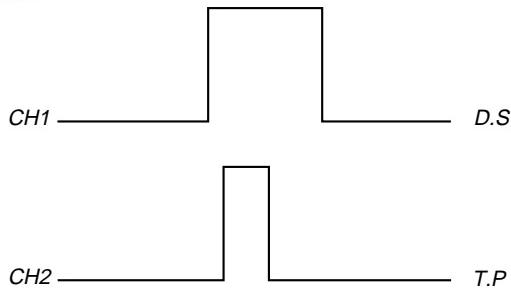
Disc Sensor Adjustment

Be sure to perform this adjustment after sensor adjustment in MECHANICAL ADJUSTMENT.

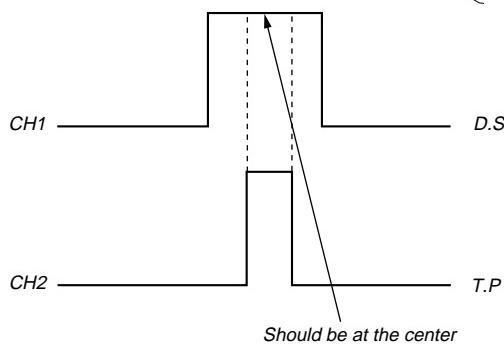
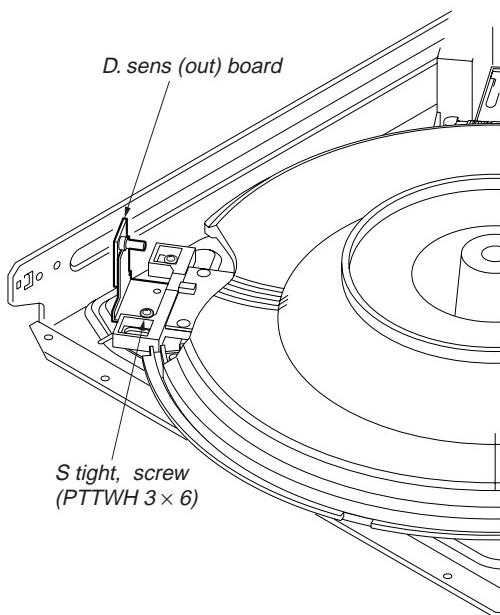
Connection:



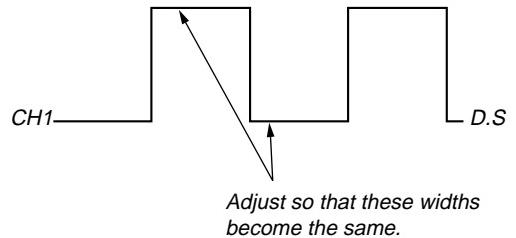
Waveform:



1. Connect the oscilloscope to Pins ①, ②, and ③ of TP1 of the MAIN board.
2. Check that no discs are loaded in the unit.
3. With the power ON, while pressing the [GROUP FILE] and [MEGA CONTROL] buttons, press the [I/O] button. Rotate the [DISC/CHARACTER] dial, select "Table Rotation" and press the dial.
The disc table starts to rotate in the clockwise direction.
4. Loosen the fixing screw, move the mounting board (SENSOR), and secure the mounting board (SENSOR) at the point the H portion of the T.P waveform comes the center of the H portion of the D.S waveform.

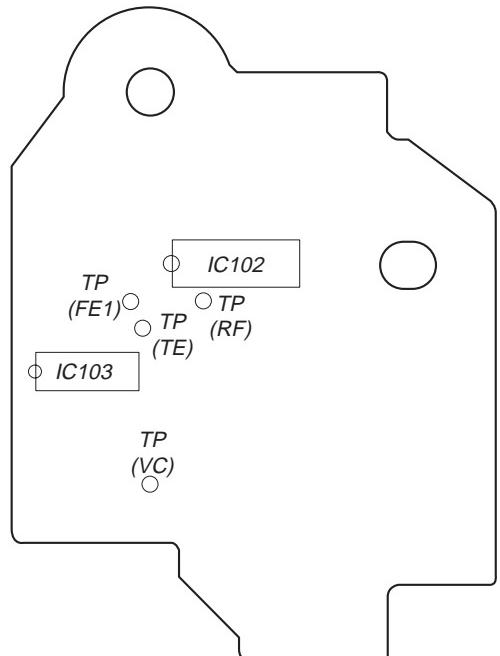


5. Rotate the [DISC/CHARACTER] knob in the counterclockwise direction and the disc table starts to rotate in the same direction. Check that the waveform at this time is the same as that in step 4. If larger by a considerable extent, rotate the [DISC/CHARACTER] knob in the clockwise direction and the disc table starts to rotate in the same direction. Repeat from step 4.
6. Rotate RV501 of the MAIN board and adjust so that the H and L portions of the D.S waveform become the same.



Adjustment Location

[BD BOARD] – Side B –



SECTION 7 DIAGRAMS

7-1. CIRCUIT BOARDS LOCATION

